IN THE SPECIFICATION:

Please amend the Paragraph beginning on pg. 6, line 10 as follows:

In a microstructured optical fiber, to obtain desired characteristics with respect to chromatic dispersion or mode field diameter, it is important to accurately control the area fraction of void in the fiber, which is the ratio of the area occupied by the void to the area of a given region in the fiber cross section before drawing.

Please amend the Paragraph beginning on pg. 15, line 1 as follows:

The optical fiber of the present invention can be made by a method for making an optical fiber having voids extending along the fiber axis, comprising the steps of preparing the preform having a plurality of voids whose cross-sectional areas are uniform along its axis and an initial area fraction of the voids, and drawing the optical fiber from this preform, wherein a means to measure the resultant area fraction of voids in the drawn optical fiber, a means to adjust the pressure in the voids of the preform and a means to feedback the measured area fraction of voids to adjusting means are included.

Please amend the Paragraph beginning on pg. 15, line 11 as follows:

The cross-sectional areas of voids in the drawn optical fiber depend on the pressure in the voids during fiber drawing. Accordingly, by adjusting the pressure in voids during the fiber drawing, the cross-sectional areas of the voids in the drawn optical fiber can be varied as desired. Further, since it is unnecessary to change the cross-sectional structure of the preform along its axis, the optical fiber can be easily fabricated compared to the conventional fabrication technique. Further, since the pressure in voids can be changed rapidly, the structure in which the

cross-sectional distribution of the refractive index of the fiber changes steeply along the fiber axis can be easily fabricated. As a result, the method is suitable as a method for manufacturing the above-mentioned optical fiber according to the present invention. The initial area fraction of the voids is defined in the cross-section of a preform or a fiber as the ratio of the total area of the voids to the area of the cross section. Further, since the resulting area fraction of the voids in the [[drawn]] optical fiber is measured after drawing and the result of the measurement is feedbacked to the pressure adjusting means, the fluctuation in the structure of the drawn optical fiber along its axis due to the fluctuation in the structure of the preform along its axis and the temporal fluctuation in the fiber drawing environment can be suppressed, whereby an optical fiber with desired optical characteristics can be fabricated with high yields. ~~The area fraction of the voids is defined in the cross section of a preform or a fiber as the ratio of the total area of the voids to the area of the cross section.~~

Please amend the Paragraph beginning on pg. 16, line 2 as follows:

Alternatively, the method of making an optical fiber according to the present invention is a method of making an optical fiber, which contains a plurality of regions made of sub mediums whose refractive indices differ from those of main mediums constituting the optical fiber comprising the steps of preparing a preform having a plurality of regions made of sub mediums whose cross-sectional areas are constant along the preform axis, and drawing the optical fiber from this preform, wherein a means to adjust the heating condition through varying at least one of the temperature of the drawing furnace for heating the preform and the time [[length]] duration of ~~for the fiber to pass~~ the drawing ~~furnace~~ is included.

Please amend the Paragraph beginning on pg. 17, line 9 as follows:

Here, it is desirable to measure the resultant area fraction of voids or sub-medium regions in the drawn optical fiber, and feedback control the temperature in the drawing furnace and/or the time for heating the preform with the area fraction of voids or sub-medium regions thus measured. According to such an operation, the fluctuation in the structure of the drawn optical fiber along its axis due to the fluctuation in the structure of the preform along its axis and temporal fluctuation in the fiber drawing environment can be suppressed, whereby an optical fiber with desired optical characteristics can be fabricated with high yields.

Please amend the Paragraph beginning on pg. 17, line 21 as follows:

For obtaining the area fraction of voids or sub-medium regions in the drawn optical fiber, the following means can be employed. In the first means, the speed at which the preform is supplied, the speed at which the fiber is drawn and the fiber diameter during fiber drawing are measured, and the resulting area fraction of voids (or sub-medium regions) in the drawn optical fiber is calculated from these measured values[[,]] where the preform diameter and the initial area fraction of voids (or sub-medium regions) in the preform~~, wherein the latter two quantities~~ are measured before fiber drawing. Since the glass volume of the fiber drawn during a given period is equal to the glass volume of the preform supplied during the same period, the resulting area fraction of the voids (or sub-medium regions) in the drawn fiber can be obtained from measurement of the above-mentioned quantities. In the second means, the speed at which the fiber is drawn, the fiber diameter, the drawing tension and the temperature in drawing furnace during fiber drawing are measured, and the resulting area fraction of voids (or sub-medium regions) in the drawn optical fiber is calculated from these measured values. Since the drawing

tension is related to the initial area fraction of voids (or sub-medium regions), the drawing speed, and the furnace temperature, the resulting area fraction is ~~obtained~~ calculated from measurement of the above-mentioned quantities. Since the resulting area fraction of voids or the sub-medium regions ~~can be grasped~~are calculated during the fiber drawing with above-mentioned techniques, an optical fiber with desired optical characteristics can be fabricated with high yields by ~~feedbacking them~~correlating their characteristics to the fiber drawing conditions.

Please amend the Paragraph beginning on pg. 19, line 7 as follows:

The preform is fabricated in this manner, which is different from those made by the conventional method of bundling tubes and/or rods, where the preform does not have [[no]] voids formed by the gaps among the tubes and/or the rods. Accordingly, it becomes easy to control the resulting area fraction of voids in the drawn fiber to the desired amount, whereby an optical fiber with desired optical characteristics can be fabricated with high yields. Further, since the cleaning the wall surfaces of the voids is facilitated, the optical fiber with low transmission loss can be fabricated. And since the preform is formed in a single piece, the reproducibility of the fabrication can be also enhanced.

Please amend the Paragraph beginning on pg. 39, line 11 as follows:

Inventors of the present invention have found that while the initial area fraction of voids (the ratio of the total cross-sectional area of the voids to the cross-sectional area of the cladding) in the optical fiber 10 mainly depends on the area fraction of voids in the preform 50, the resulting area fraction of the voids can be also adjusted [[even]] in the fiber drawing step. To reduce the resulting area fraction of the voids during or after the drawing step, one or a

combination of the following techniques can be employed: (1) a technique which reduces the pressure in the voids 13 by pressure adjusting means 73, (2) a technique which elevates the temperature in the fiber drawing furnace 60, (3) a technique which reduces the supply speed V_a by the preform supply means 71 or the fiber drawing speed V_b by the towing means 81 so as to increase the time length (heating time) [[for]] of the preform ~~to pass~~ in the fiber drawing furnace 60. To increase the resulting area fraction of the voids after drawing, the opposite of the above-mentioned techniques can be employed.

Please amend the Paragraph beginning on pg. 40, line 3 as follows:

By changing these parameters during fiber drawing by way of the controller 65, it becomes possible to fabricate the optical fiber where the resulting area fraction of voids change along the fiber axis so that an optical fiber whose chromatic dispersion changes along the fiber axis can be easily fabricated. Such an optical fiber is effective in suppressing the total chromatic dispersion and the four-wave mixing which deteriorates the transmission quality. Further, it may be also possible to fabricate an optical fiber having sections without voids in cross section. Such an optical fiber can separate the microstructures (voids) from the outer environment so that the contamination of the inside of the voids during splicing it and the increase of loss due to such contamination can be effectively prevented by using these portions without void for splicing.

Please amend the Paragraph beginning on pg. 40, line 19 as follows:

In operation, by obtaining the resulting area fraction of the voids in the optical fiber 10 from measurement during fiber drawing and then by performing the feedback control of the pressure in the voids 13, the furnace temperature and the time [[for]] the fiber ~~to pass~~ is in the

fiber drawing furnace 60 using the controller 65 based on the obtained area fraction of the voids, the optical fiber 10 ~~having the~~has a desired distribution of the resulting area fraction of the voids along the fiber axis and is [[can be]] fabricated with a high accuracy.

Please amend the Paragraph beginning on pg. 41, line 2 as follows:

Provided that the initial diameter d_p and the initial area fraction of the voids f_p of the preform 50 are measured before fiber drawing, the resulting area fraction of the voids f_f in the optical fiber 10 ~~can be obtained~~is calculated by the following equation during drawing from the outer diameter d_f of the optical fiber 10 measured by the measuring means 80, the supply speed V_a of the preform 50 measured by the supply means 71 and the fiber drawing speed V_b of the optical fiber 10 measured by the towing means 81.

$$f_f = f_p \, x(d_p^2 V_a / d_t^2 V_b)$$

Please amend the Paragraph beginning on pg. 42, line 1 as follows:

The viscosity of glass which constitutes the preform 50 is given as a function of temperature and hence, the viscosity η_f of the fused lower end 50c of the preform 50 is obtained from the furnace temperature. On the other hand, the tension T_f given to the optical fiber 10 is obtained from the dynamometer 83. Here, the tension T_f necessary for achieving a given fiber drawing speed V_b at a given viscosity η_f and a given fiber diameter d_f is determined if the resulting area fraction of the voids f_f in the optical fiber 10 is given and decreases corresponding to the increase in the resulting area fraction of the voids f_f in the optical fiber 10. Here, since

parameters other than the resulting area fraction of the voids f_f are known values, it is possible to obtain the resulting area fraction of the voids f_f from the above relationship.

Please amend the Paragraph beginning on pg. 42, line 16 as follows:

In any one of these embodiments, the microstructured optical fiber which changes the resulting area fraction of the voids along the fiber axis [[can be]] is easily formed. Further, it is no [[more]]longer necessary to perform the operation to combine a large number of tubes or rods at a given arrangement, which has been necessary in the conventional fabrication method and hence, the labor saving can be achieved and the reproducibility of the operation can be enhanced whereby products having a stable quality can be fabricated. Further, since the preform does not contain the gaps among combined tubes and/or rods, the removal of the contaminants and the pressure control during fiber drawing can be effectively performed.

Please amend the Paragraph beginning on pg. 43, line 4 as follows:

These embodiments are applicable not only to a case in which the microstructured optical fiber, which changes the resulting area fraction of the voids along the fiber axis is fabricated but also a case in which a microstructured optical fiber ~~which has~~having the uniform voids is fabricated. By performing the feedback control of the resulting area fraction of the voids, the accuracy of the uniformity of the voids can be further enhanced compared with the voids formed by the conventional technique.

Please amend the Paragraph beginning on pg. 43 , line 26 as follows:

These embodiments are also applicable to a case in which a sub medium made of a material other than gas is filled in the voids 13 of the preform 50. In this case, the preform 50, which fills the sub medium in the voids 13, is prepared and thereafter the fiber drawing is performed using the fiber drawing device shown in FIG. 9 or FIG. 10. To adjust the resulting area fraction of the sub-medium regions, the furnace temperature of the fiber drawing furnace 60 or the heating time of the preform may be adjusted. When the sub medium is a liquid, the above-described technique which adjusts the pressure in the sub medium can be adopted. Since the above-described technique to obtain the resulting area fraction of the voids can also be used to obtain the resulting area fraction of the sub-medium regions, the detail of the technique is omitted.

Please amend the Paragraph beginning on pg. 49, line 2 as follows:

A fifth embodiment is directed to a method for selectively closing voids 3e of an optical fiber 10e fabricated by fiber drawing. FIG. 15 is a view for explaining this closing processing step. It is preferable that this closing processing step is performed immediately before or immediately after the operation of a towing device 81 in a fiber drawing device shown in FIG. 9 and FIG. 10 (in the drawing, an example which performs the processing immediately before the operation by the towing device 81 is shown). A heater 85 is arranged at a position closer to the preform side than the ~~drawing~~ towing device 81 and this heater 85 selectively performs the heating of the optical fiber 10e upon receiving a command from a controller 65. Although given voids 3e are formed in the optical fiber 10e by the fabrication method of the first to the third embodiments, at a position selectively heated by the heater 85, silica glass which constitutes a

main medium of the optical fiber 10e is fused and, as a result, the voids 3e at a position are closed whereby a section B shown in FIG. 1 can be formed.